

5

Claims

10

15

20

25

30

1. An electrostatic microvalve comprising a partition separating a first and second valve chamber from each other and having a through duct extending through it, such through duct opening at a first and, respectively, a second duct opening into the first and, respectively, the second valve chamber, and furthermore comprising a valve member arranged in the first valve chamber, which by means of an electrostatic drive is able to be switched over between an open position clear of the first duct opening and a closed position closing the first duct opening, wherein in the second valve chamber a control member is arranged associated with the second duct opening and able to be actuated by a further electrostatic drive, such control member being able to be moved, when the valve member assumes its open position and permits a transfer of fluid from the second into the first valve chamber, from a neutral position freeing the second duct opening into a control position at least partly closing the second duct opening in order to reduce the flow force acting on the valve member during subsequent switching over into the closed position.

2. The microvalve as set forth in claim 1, wherein switching movements of the valve member and of the control member are set to be at least approximately perpendicular to the plane of extent of the partition.

3. The microvalve as set forth in claim 1, wherein the second duct opening is, in the control position of the control member, only partially closed by same.

5 4. The microvalve as set forth in claim 1, wherein the electrostatic forces of the further electrostatic drive urge the control member into the neutral position.

10 5. The microvalve as set forth in claim 1, wherein the control member is so designed and arranged that, when electrostatic drive is deactivated, it is moved into the control position with the aid of the flow.

15 6. The microvalve as set forth in claim 1, wherein the control member is biased by spring force toward the control position.

20 7. The microvalve as set forth in claim 1, wherein the valve member is so designed that in the pressure-less state of the system and with the electrostatic actuator deactivated the valve member assumes the closed position.

25 8. The microvalve as set forth in claim 1, wherein the valve and/or the control member are designed in the form of a diaphragm or a lug.

9. The microvalve as set forth in claim 1, in the form of a 2/2 or 3/2 valve.

30 10. A method for the operation of a microvalve having a through duct extending through a partition, the first opening of such duct being able to be selectively closed or opened by an electrostatically operated valve member, and for switching over the valve member into the closed
35 position the second opening of the through duct is at

least partially closed by means of an electrostatically operated control member in order to reduce the flow force acting on the valve member.

5 11. The method as set forth in claim 10, wherein the control member is switched back into a neutral position clearing the second duct opening again after the valve member is switched over in the closed position.

10 12. The method as set forth in claim 10, wherein the control the switching over of the control member in the control position at least partially closing the second duct opening is aided or caused by fluid flowing to the through duct.